REMARKS

Claims 1 and 3-18 are currently pending, claim 2 stands canceled without prejudice or disclaimer of the subject matter. Applicant notes that no amendments are made with this Reply. Reconsideration of the rejections and allowance of the pending application in view of the following remarks is respectfully requested and believed to be appropriate.

Applicant notes with appreciation the Examiner's acknowledgement of Applicant's claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f), as well as confirmation of receipt of the certified copy of the priority document.

Applicant also notes with the appreciation the Examiner's indication that the drawings filed on November 30, 1999 have been accepted.

In the outstanding Office Action of December 8, 2006, the Examiner has rejected claims 1, 3-9, 11 and 12 under 35 U.S.C. §103(a) as being unpatentable over MIYAMOTO (U.S. Pat. No. 6,593,965), KONDO (U.S. Pat. No. 5,912,708), TSANG (U.S. Pat. No. 5,900,623), HAYASHI (U.S. Pat. No. 5,734,427) and JUDD (U.S. Pat. No. 4,779,135). Further, the Examiner has rejected claims 10 and 13-18 under 35 U.S.C. §103(a) as being unpatentable over MIYAMOTO, KONDO, HAYASHI and JUDD. Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness, and traverses each of these rejections for at least the reasons set forth below.

I. *The Examiner has **NOT** demonstrated three basic criteria necessary to establish a prima facie case of obviousness*

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to

combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim recitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Furthermore, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab,* 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee,* 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); *In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones,* 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, as noted above, obviousness has not been established.

(A) *There exists NO motivation to combine the references*

Regarding the Section 103 rejections of claims 1 and 3-18, Applicant submits that there would have been no motivation to combine MIYAMOTO with KONDO, much less MIYAMOTO with KONDO, HAYASHI and JUDD, as suggested by the Examiner (the Examiner also includes TSANG in rejecting claims 1, 3-9, 11 and 12). In fact, Applicant submits that the references teach away from such an attempt.

MIYAMOTO teaches two embodiments for carrying out his invention (*see, e.g.,* Figures 2 and 4 and the corresponding text). In the first embodiment, *i.e.* Fig. 2, MIYAMOTO teaches using an interpolation system that reduces an original image by averaging four color pixel values for each color to derive a single pixel data. (*See, e.g.,* column 4, line 17 through column 5, line 6, MIYAMOTO.) In the second embodiment, MIYAMOTO teaches that the "pixel interpolation circuit 12 transmits no more than the first, second, fifth, and sixth lines of pixel data from the CCD" (*see* column 5, lines 24-26, MIYAMOTO). MIYAMOTO's two embodiments are mutually exclusive.

Referring to Fig. 3, MIYAMOTO shows a configuration of a region of the CCD 1 (shown in, *e.g.,* Fig. 1), consisting of thirty-six pixels, including four groupings of four pixels each of which are to be used in interpolating a displayed image. Applicant has reproduced a modified variation of Fig. 3 to better illustrate the pixels from the CCD 1 that are deleted (shown below as blacked-out circles), and the pixels that are subsequently used to interpolate a displayed image (shown below as numbered pixels).
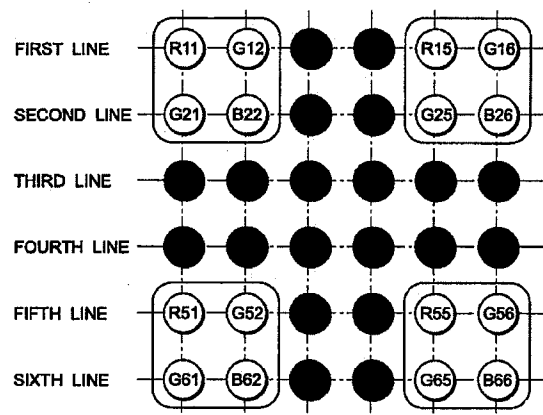
Cropped & Modified FIG. 3, MIYAMOTO

In the first embodiment (referring to, *e.g.,* column 3, line 56 to column 4, line 20, and Fig. 3,), MIYAMOTO teaches, *e.g.,*

"As shown in FIG. 3, RGB filter matrices, each being made up of four neighboring elements, are lined up. To generate a horizontally and vertically reduced image of half in each direction, each group of four neighboring elements is filtered (thinned out) into the half the number, and the resulting half is then read out. Each of the four groups of pixel data enclosed by lines in FIG. 3 is then stored in the data buffer 3.

More specifically, the pieces of pixel data are stored in the CCD 1 in both the horizontal order of 1, 2, . . . , 5, 6, . . . and the vertical order of 1, 2, . . . , 5, 6, ... The CCD 1 is configured in such a manner that each line of pixel data is selected one after another, and read out in sync with a vertical transmission pulse signal of the CCD 1, in the order of pixel data R11, G12, R13, G14, . . . , G21, B22, G23, B24 . . . . As for unnecessary lines, the CCD controller 6 adds excessive pulse signals to the vertical transmission pulse signal, resulting in skipping the unnecessary lines. Therefore, the read-out time period will be reduced to half.

The pixel interpolation operation will then be explained. In the conventional technology, the average of neighboring pixels is utilized. However, since the filtered (thinned out) pixel data is stored in the data buffer 3, the distance between the neighboring filtered pixels is different from that between the initially captured pixels. Thus, the pixel interpolation operation cannot be correctly performed with the filtered (thinned out) pixels. To solve the problem, the filtered (thinned out) pixels are each weighted, and subjected to the pixel interpolation operation. For example, to perform an pixel interpolation operation on the red component R22 at the pixel B22 in FIG. 3, the pixels R11, R51, R15, and R55 are used to interpolate R22. . . ."

Further, at column 3, lines 17-19, MIYAMOTO teaches that the "data buffer 3 is capable

of accommodating three lines of pixel data (the number of which being equal to half in each

single line of the CCD 1)."

In the second embodiment (referring to Figs. 4-6), MIYAMOTO does away with the

buffer 3 (*see* column 5, lines 7-12), but instead, apparently, directly stores lines of pixel data

output from the CCD 1 in the video memory 14 in accordance with the timing chart shown in

Fig. 5. It appears that MIYAMOTO only stores alternating pairs of lines (*e.g.*, lines 1, 2, 5, 6, 9,

10, . . .) in the video memory 14. Although MIYAMOTO does not appear to explicitly state that

the calculations performed by the Calculation Unit 35 (shown in Fig. 6) are the same as those

performed by the Calculation Unit 25 (shown in Fig. 2), it appears that such is the case. Hence,

in the second embodiment, like the first embodiment, MIYAMOTO interpolates the thinned out pixels by performing a pixel interpolation operation so as to interpolate, *e.g.*, a red component R22 at the pixel B22 in FIG. 3 using the pixels R11, R51, R15, and R55.

On the other hand, claim 1 recites, *inter alia*, "a thinning processor that thins out some of said pixel data to generate a thinned image data, each pixel in the thinned pixel data being separated from each other pixel by at least one pixel data, and colors of the thinned pixel data being arranged in said predetermined distribution; and an interpolation processor that performs an interpolation process on said thinned image data to generate an interpolated image data for each of said colors, wherein said colors of said original image data are arranged in such a manner that a (m x m) matrix, formed by said plurality of colors, is repeated, and said thinning processor thins out (m x (n-1)) number of pixel data for every (m x (n-1)+1) number of pixel data in a horizontal direction and a vertical direction of an image corresponding to said original image data, wherein each of "m" and "n" is a positive integer greater than 1."

Further, claim 10 recites, *inter alia*, "a thinning processor that thins out some of said pixel data before said pixel data are subjected to said interpolation process, so that said second image is composed of a smaller number of pixels than said first image, wherein each pixel in the thinned pixel data is separated from each pixel by at least one pixel data, and wherein said colors of said original image data are arranged in such a manner that a (m x m) matrix, formed by said plurality of colors, is repeated, and said thinning processor thins out (m x (n-1)) number of pixel data for every (m x (n-1)+1) number of pixel data in a horizontal direction and a vertical direction of an image corresponding to said original image data, wherein each of "m" and "n" is a positive integer greater than 1."

Further, claim 13 recites, *inter alia*, "a thinning processor that thins out (mx(n-1)) number of pixels of the original image for every (mx(n-1)+1) number of pixels along each axis of the original image to generate a thinned image, wherein m and n are positive integers greater than 1, and wherein each pixel in the thinned image is separated from each other pixel by at least one pixel; and an interpolation processor that interpolates the thinned image to generate an interpolated image for each of the plurality of colors, wherein for each pixel, a value is calculated based upon adjacent pixel data such that the adjacent pixel data are each multiplied by a weight coefficient, the resulting values are summed, and the sum is divided by a number of the adjacent pixel data."

The Examiner concedes, *e.g.*, at page 3 of the above-noted Office Action, that MIYAMOTO "does not teach that the thinned pixel data can be selected so that each pixel in the thinned pixel data is separated from each other by at least one pixel data."

According to each of claims 1, 10 and 13, after the thinning out process, the resultant pixels are distributed such that each of the pixels is separated from every other pixel by at least one pixel. Further, an arrangement of the color components of the thinned image data is identical with that of the original image data as shown in the illustration below, where the
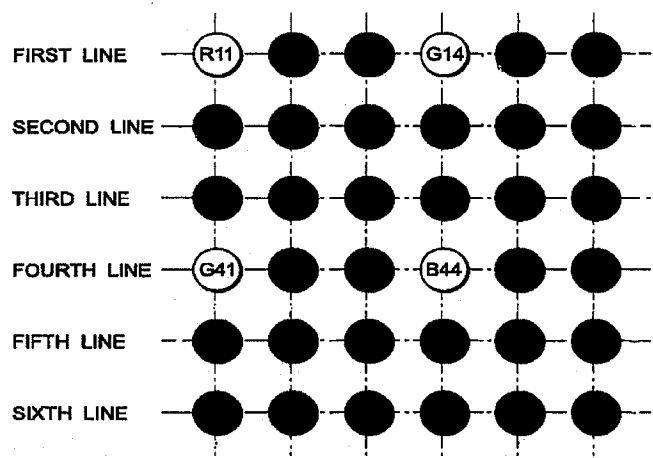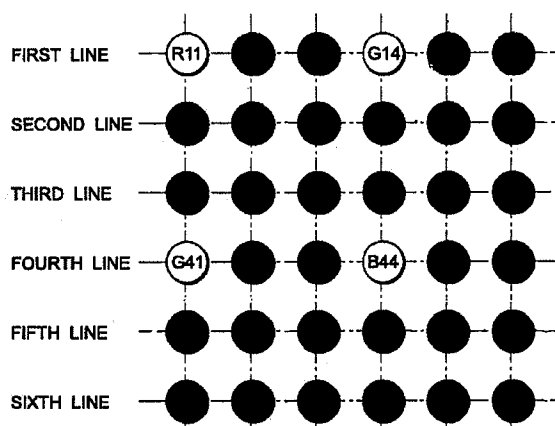

Thinned Out Pixel Data According to An Aspect of The Invention

thinned-out pixels are shown as blacked-out circles and the remaining pixels are shown as labeled circles.

Thus, as shown in the side-by-side comparison of the thinned out pixel array according to MIYAMOTO, and that according to an aspect of the invention (shown below), it is apparent that the two pixel arrays are very different. It is evident from the below comparison that MIYAMOTO contradicts the above noted claimed subject matter of, for example, a thinning out process where the resultant pixels are distributed such that each of the pixels is separated from every other pixel by at least one pixel, and an arrangement of the color components of the thinned image data is identical with that of the original image data.
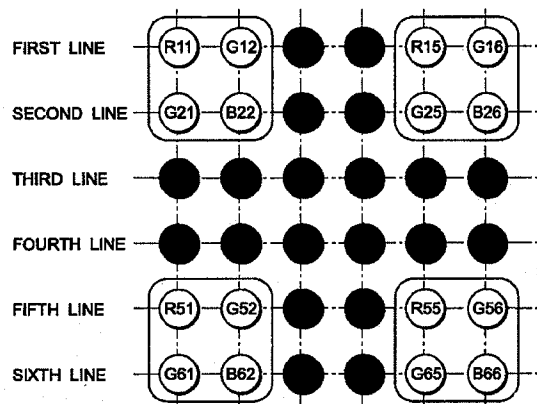
Cropped & Modified FIG. 3, MIYAMOTO

Thinned Out Pixel Data According to An Aspect
of The Invention

Further, MIYAMOTO, in no uncertain terms, teaches that his invention was created to avoid having to store multiple rows of image data in order to average pixel data for a given color across an array of color pixels. For example, at column 1, lines 46 *et seq.*, MIYAMOTO teaches that the system shown in Fig. 7 is problematic in that it requires a large-scale memory, such as a DRAM, to temporarily store pixel data. Moreover, MIYAMOTO explains, the system of Fig. 7 takes a long time to store all of the interpolated pixel data in the video memory.

KONDO, on the other hand, teaches a concept of pixel thinning akin to the above noted first embodiment of MIYAMOTO. Referring, *e.g.*, to column 12, lines 53-58, as well as Figures 8 and 9, KONDO teaches dividing an "HD picture into square blocks consisting of three horizontal pixels x three vertical pixels, that is, nine pixels, and ... [using] the average value of several pixels ... of the individual blocks as the pixel value of the center pixel, thereby forming the SD picture." Moreover, the first and second embodiments of MIYAMOTO are not additive, but alternative. If one were to attempt to combine KONDO with MIYAMOTO, the ordinary skilled artisan would have been quick to recognize that such a combination would destroy the spirit and scope of the MIYAMOTO patent and would therefore have been motivated to not combine them.

As noted above, MIYAMOTO, in no uncertain terms, teaches that his invention was created to avoid having to store multiple rows of image data in order to average pixel data for a given color across an array of color pixels, which is exactly what KONDO would suggest if applied to the color pixel array in MIYAMOTO. (*See, e.g.*, column 1, lines 46 *et seq.*, MIYAMOTO.) Thus, any attempt to combine MIYAMOTO with KONDO, assuming *arguendo* that such a combination were possible (Applicant submits it is not), would result in a combination system that would take pixels, *e.g.*, R11, R15, R51 and R55 in Figure 3 of MIYAMOTO, and average their values to derive a value for a generated, virtual pixel that would be located at the midpoint of the matrix shown in Figure 3 of MIYAMOTO. This, for the most part is how the disclosed prior art of MIYAMOTO, *i.e.* Figure 7, functioned. (*See, e.g.*, column 1, lines 45-55, MIYAMOTO.) Hence, this combination, is exactly what MIYAMOTO was trying to avoid in the first place, in designing a system that reduced memory requirements. (*See,*

e.g., column 1, line 46 to column 2, line 2, MIYAMOTO.) Thus, MIYAMOTO expressly teaches away from the Examiner's proposed combination.

Hence, Applicant submits that one of ordinary skill in the art would not have been motivated to combine MIYAMOTO with KONDO, as suggested by the Examiner. In fact, it appears that the Examiner has used impermissible and improper hindsight in formulating the rejections at issue. Outside of the teachings of Applicant's above-captioned application specification, there exists no motivation for combining the MIYAMOTO and KONDO teachings as posited by the examiner.

The Examiner provides no motivation or suggestion to make the claimed combination, which must be found in the prior art, not in Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ 2d 1438 (Fed. Cir.). MIYAMOTO and KONDO do not provide such a motivation or suggestion. Even if MIYAMOTO could be combined with KONDO, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). The relied upon references fail to suggest such a desirability. Accordingly, for this additional reason, Applicant submits that the Examiner has improperly combined MIYAMOTO with KONDO.

Regarding claim 1 in particular, the Examiner concedes, *e.g.*, at page 4 of the above-noted Office Action, "that Miyamoto does not specifically teach an imaging device that has photo-diodes rather states that the imaging device is a CCD image sensor." Applicant adds that MIYAMOTO does not implicitly teach an imaging device that has photo-diodes. The Examiner relies on TSANG for a teaching of photo-diodes, and suggests that MIYAMOTO be combined

with TSANG. However, the Examiner is silent as to what role KONDO would play in the Examiner's proposed combination of MIYAMOTO and TSANG.

Nonetheless, Applicant submits that one of ordinary skill in the art would not have been motivated to combine MIYAMOTO with TSANG, as suggested by the Examiner, much less MIYAMOTO and KONDO with TSANG. In fact, it appears that the Examiner has again used impermissible and improper hindsight in formulating the rejections at issue. Outside of the teachings of Applicant's above-captioned application specification, there exists no motivation for combining the MIYAMOTO, KONDO and TSANG teachings as posited by the examiner.

The Examiner again provides no motivation or suggestion to make the claimed combination, which must be found in the prior art, not in Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ 2d 1438 (Fed. Cir.). MIYAMOTO, KONDO and/or TSANG do not provide such a motivation or suggestion. Even if MIYAMOTO could be combined with KONDO, and if MIYAMOTO could be combined with TSANG, and, further, if MIYAMOTO and KONDO could be combined with TSANG, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). The relied upon references fail to suggest such a desirability. Accordingly, for this additional reason, Applicant submits that the Examiner has improperly combined MIYAMOTO with TSANG.

At page 5 of the above-noted Office Action, the Examiner states "Miyamoto does not specifically state that the thinning processor thins out 2 pixel data for every 3 pixel data." Applicant adds that MIYAMOTO does not teach, explicitly or implicitly, alone or in any proper combination, *inter alia*, thinning out "(m x (n-1)) number of pixel data for every (m x (n-1) + 1)

number of pixel data in a horizontal direction and a vertical direction of an image corresponding to said original image data," as recited in, *e.g.*, independent claims 1 and 10, and similarly recited in independent claim 13. Applicant further adds that any proper combination of MIYAMOTO and KONDO, and/or TSANG (Applicant submits that teachings may not be properly combined), also fails to teach the noted recitations of, *e.g.*, claims 1, 10 or 13.

Recognizing the shortcomings found in MIYAMOTO, the Examiner has introduced a fourth reference (third reference in the Section 103 rejections of claims 10 and 13-18), HAYASHI, in an attempt to provide a teaching for thinning out pixels read from an image pickup device in order to match the aspect ratio of the thinned out pixels to that of a display on which the pixels are to be displayed. However, the Examiner has again failed to take into consideration the explicit teachings of the reference, in this case HAYASHI.

At column 4, lines 53-67 of HAYASHI, which is referenced by the Examiner at page 5 of the above-noted Office Action, HAYASHI explicitly teaches that "[a] control signal from the second control circuit of the controller 38 causes the horizontal 1,280 dots to be read out as they are, but causes the vertical 1,024 dots to be read out every other line." As appears evident from Fig. 1 of HAYASHI, the pixels are thinned out at the ADC 16 by reading out alternating lines. Further, at column 3, lines 7-15, HAYASHI teaches that "a frame memory capable of storing at least one frame of high-resolution digital image data" is included in the ADC 16. This teaching explicitly teaches away from the teachings of MIYAMOTO, which state that a large-scale memory, such as a DRAM, is undesirable and should not be used (*see, e.g.*, column 1, line 63 to column 2, line 2, MIYAMOTO).

Further, HAYASHI does not make up for the deficiencies found in MIYAMOTO and KONDO. For example, HAYASHI does not teach or suggest a manner of modifying

MIYAMOTO and KONDO (and TSANG) in order to make the systems compatible with each other without destroying the MIYAMOTO system. HAYASHI appears to be relied on by the Examiner only to show that it was known to match a video resolution of a signal output to a monitor with the display resolution of the monitor. Since MIYAMOTO and KONDO are incompatible, and HAYASHI does not render, or suggest a manner of rendering, the MIYAMOTO and KONDO (and TSANG) systems compatible without destroying the MIYAMOTO system, the ordinary skilled artisan would not have been motivated to combine MIYAMOTO and KONDO (and TSANG), much less HAYASHI.

Thus, one of ordinary skill in the art would not have been motivated to combine HAYASHI with MIYAMOTO, much less HAYASHI with any combination of MIYAMOTO, KONDO, (and TSANG), as suggested by the Examiner.

Applicant submits that it appears the Examiner has again used impermissible and improper hindsight in formulating the rejections at issue. Outside of the teachings of Applicant's above-captioned application specification, there exists no motivation for combining the MIYAMOTO, KONDO, HAYASHI (and TSANG) teachings as posited by the examiner.

The Examiner again provides no motivation or suggestion to make the claimed combination, which must be found in the prior art, not in Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ 2d 1438 (Fed. Cir.). MIYAMOTO, KONDO, HAYASHI (and TSANG) do not provide such a motivation or suggestion. Even if MIYAMOTO could be combined with KONDO, and if MIYAMOTO could be combined with HAYASHI, and if MIYAMOTO could be combined with TSANG, and, further, if MIYAMOTO and KONDO (and TSANG) could be combined with HAYASHI, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the

combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). The relied upon references fail to suggest such a desirability. Accordingly, for this additional reason, Applicant submits that the Examiner has improperly combined MIYAMOTO with HAYASHI.

At page 5, of the above-noted Office Action, the Examiner concedes that "Miyamoto does not teach that the interpolation function can be calculated for each pixel based upon adjacent pixel data such that the adjacent pixel data are each multiplied by a weight coefficient, the resulting values are summed, and the sum is divided by a number of the adjacent pixel data." Applicant adds that MIYAMOTO does not suggest such a feature, and, in fact, teaches away from such a feature (*see* column 4, lines 8 through column 5, line 6, MIYAMOTO).

Recognizing the shortcomings of MIYAMOTO, the Examiner relies on a fifth reference (fourth reference in the Section 103 rejections of claims 10 and 13-18) JUDD, for a teaching of the above feature. Applicant submits, however, that JUDD explicitly teaches away from the teachings of MIYAMOTO, which state that a large-scale memory, such as a DRAM, is undesirable and should not be used (*see, e.g.,* column 1, line 63 to column 2, line 2, MIYAMOTO). For example, JUDD teaches using at least two frame memories in addition to a key memory (*see* Fig. 2) in composing multiple images.

Further, Applicant submits that JUDD is from an entirely different field of endeavor than that of MIYAMOTO, KONDO, HAYASHI or TSANG. JUDD is directed to a multi-image composer that insets one image into another image. Meanwhile, MIYAMOTO, KONDO, HAYASHI (and TSANG) are each directed to a single image processing and display system.

Thus, Applicant submits that one of ordinary skill in the art would not have been motivated to combine MIYAMOTO with JUDD, as suggested by the Examiner, much less MIYAMOTO, KONDO, HAYASHI (and TSANG) with JUDD. In fact, it appears that the

Examiner has again used impermissible and improper hindsight in formulating the rejections at issue. Outside of the teachings of Applicant's above-captioned application specification, there exists no motivation for combining the MIYAMOTO, KONDO, HAYASHI (and TSANG) and JUDD teachings as posited by the examiner.

The Examiner again provides no motivation or suggestion to make the claimed combination, which must be found in the prior art, not in Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ 2d 1438 (Fed. Cir.). MIYAMOTO, KONDO, HAYASHI (and TSANG) and JUDD do not provide such a motivation or suggestion. Even if MIYAMOTO could be combined with KONDO, and if MIYAMOTO could be combined with HAYASHI, and if MIYAMOTO could be combined with JUDD (and TSANG), and, further, if MIYAMOTO, KONDO, HAYASHI, (and TSANG) could be combined with JUDD, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). The relied upon references fail to suggest such a desirability. Accordingly, for this additional reason, Applicant submits that the Examiner has improperly combined MIYAMOTO with JUDD.

Further, the Examiner has piece-mealed the treatment of the references in suggesting that MIYAMOTO be combined with each of the KONDO, TSANG, HAYASHI and JUDD references, but the Examiner has never, in fact, addressed what the combination of MIYAMOTO, KONDO, HAYASHI (and TSANG) and JUDD would have suggested to one of ordinary skill in the art, as he is required to do.

(B) *There is NO reasonable expectation of success*

As previously noted above, MIYAMOTO explicitly teaches against being combined with any combination of KONDO, TSANG, HAYASHI or JUDD, for at least the reasons set forth above. The Examiner has failed to demonstrate how MIYAMOTO may be combined with any of KONDO, TSANG, HAYASHI or JUDD to arrive at a combination teaching Applicants' claimed invention with a reasonable expectation of success. Applicant submits that the Examiner is unable to demonstrate any expectation of success in attempting to combine MIYAMOTO with any of the other references, much less all of the references, as he has done with respect to, *e.g.*, claim 1, or three of the references (KONDO, HAYASHI and JUDD) as he has done with respect to, *e.g.*, claims 10 and 13.

Further, the Examiner, using impermissible hindsight, has piece-mealed the treatment of the references, picking and choosing different elements from each of the MIYAMOTO, KONDO, TSANG, HAYASHI and JUDD references, without regard for what the entire references teach, in an attempt to map the recitations of Applicant's claims.

Applicant respectfully submits that there is no reasonable expectation of success in any proper combination of MIYAMOTO, KONDO, HAYASHI, TSANG or JUDD.

(C) *The Examiner's suggested combination does NOT teach or suggest all of the claim recitations*

Assuming *arugendo* that the combination of MIYAMOTO, KONDO, HAYASHI, (TSANG) and JUDD as posited by the Examiner in the above-noted Office Action, were possible and/or proper (Applicant emphatically submits that it was not), the combined system would still fail to teach or suggest the recitations of at least independent claims 1, 10 or 13. Namely, any combination of MIYAMOTO, KONDO and/or HAYASHI would not teach or

suggest, *inter alia*, "wherein said colors of said original image data are arranged in such a manner that a (m x m) matrix, formed by said plurality of colors, is repeated, and said thinning processor thins out (m x (n-1)) number of pixel data for every (m x (n-1)+1) number of pixel data in a horizontal direction and a vertical direction of an image corresponding to said original image data, wherein each of "m" and "n" is a positive integer greater than 1," as recited in, *e.g.*, claim 1; or, "wherein each pixel in the thinned pixel data is separated from each pixel by at least one pixel, and wherein said colors of said original image data are arranged in such a manner that a (m x m) matrix, formed by said plurality of colors, is repeated," as recited in, *e.g.*, claim 10; or, "a thinning processor that thins out (mx(n-1)) number of pixels of the original image for every (mx(n-1)+1) number of pixels along each axis of the original image to generate a thinned image, wherein m and n are positive integers greater than 1, and wherein each pixel in the thinned image is separated from each other pixel by at least one pixel," as recited in, *e.g.*, claim 13. Thus, Applicant respectfully requests reconsideration and withdrawal of the rejections of each of independent claims 1, 10 and 13.

At page 6 of the above-noted Office Action, the Examiner states that MIYAMOTO shows that the thinning processor thins out (m x (n-1)) number of pixel data for every (m x n) number of pixel data in horizontal and vertical directions. Particularly, the Examiner sets forth an example where m = n = 2 in MIYAMOTO and the thinning processor thins out two pixel data for every four pixel data. Applicant submits that in the example posited by the Examiner the resultant pixels, after the thinning out process, are not uniformly distributed, but are distributed such that two pixels are arranged adjacent to each other while simultaneously being separated by two pixels from the next grouping of adjacent pixels as shown in a cropped and modified representation of Figure 3 from MIYAMOTO shown below.

Conversely, according to an aspect of the present invention, after the thinning out process, the resultant pixels are distributed such that each of the pixels is separated from every other pixel by at least one pixel. Moreover, an arrangement of color components of the thinned image data is identical with that of the original image data as shown in the illustration below. *See*, for example, claim 1, which recites, *inter alia*, "each pixel in the thinned pixel data being separated from each other pixel by at least one pixel data, and colors of the thinned pixel data being arranged in said predetermined distribution; claim 10, which recites, *inter alia*, "wherein each pixel in the thinned pixel data is separated from each pixel by at least one pixel data"; and claim 13, which recites, *inter alia*, "wherein each pixel in the thinned image is separated from each other pixel by at least one pixel." *See* also claim 10, which further recites, *inter alia*, "wherein said colors of said original image data are arranged in such a manner that a (m x m) matrix, formed by said plurality of colors, is repeated."
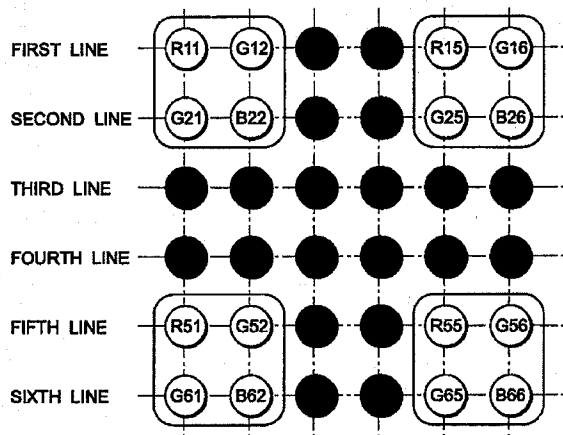
Cropped & Modified FIG. 3, MIYAMOTO
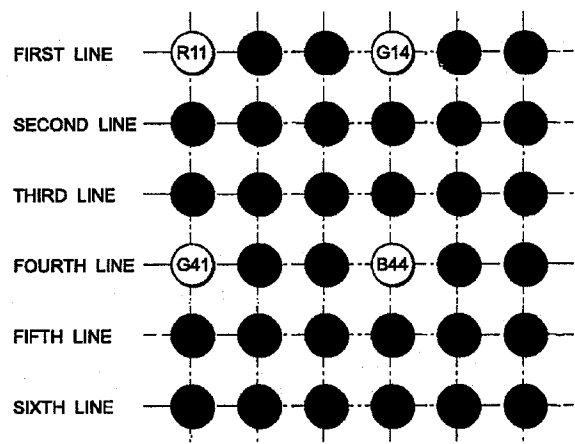
Thinned Out Pixel Data According to An Aspect of The Invention

Thus, Applicant submits that the Examiner has failed to establish a *prima facie* case of obviousness, and respectfully requests that the Examiner reconsider and withdraw all of the outstanding rejections set forth in the above-noted Office Action, and indicate the allowability of claims 1 and 3-18 in the next Office communication.

As shown above, the Examiner has failed to meet any one of the three basic criteria required for a *prima facie* case of obviousness, much less all three criteria. First, the Examiner has not shown any suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, outside of Applicant's own specification. Second, the Examiner has not shown a reasonable expectation of success in any combination of MIYAMOTO, KONDO, TSANG, HAYASHI, or JUDD. Finally, the references when combined (Applicant emphatically submits that the references may not be properly combined) do not teach or suggest all of the claim recitations.

Applicant submits that independent claims 1, 10 and 13 are in condition for allowance in view of the above-noted remarks. Further, dependent claims 3-9, 11, 12 and 14-18 are also submitted to be in condition for allowance at least in view of their dependence from the allowable base claims and further based upon their recitations of additional features of the present invention.

In view of the remarks contained herein, Applicant respectfully requests reconsideration and withdrawal of each of the outstanding rejections together with allowance of all of the claims pending in the present application. Such action is respectfully requested and is believed to be appropriate.
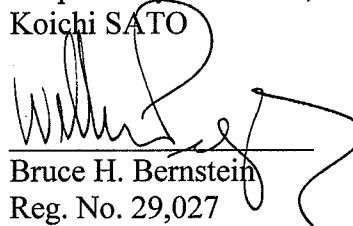
SUMMARY AND CONCLUSION

In view of the foregoing, it is submitted that the Examiner's rejections under 35 U.S.C. § 103 in the Office Action dated December 8, 2006, have been overcome and should be withdrawn. The present Reply is in proper form, and none of the references teach or suggest Applicant's claimed subject matter. Accordingly, Applicant requests allowance of the present application.

Should an extension of time be required in order to render this response timely and/or complete, a request for an extension of time, under 37 C.F.R. §1.136(a), is herewith made in an amount equal to the time period required to render this response timely and/or complete. Authorization is hereby provided to charge any required extension of time fee and/or any fee required to maintain the pendency of the application to Deposit Account No. 19-0089.

Should the Examiner have any questions or comments regarding this response, or the present application, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,
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